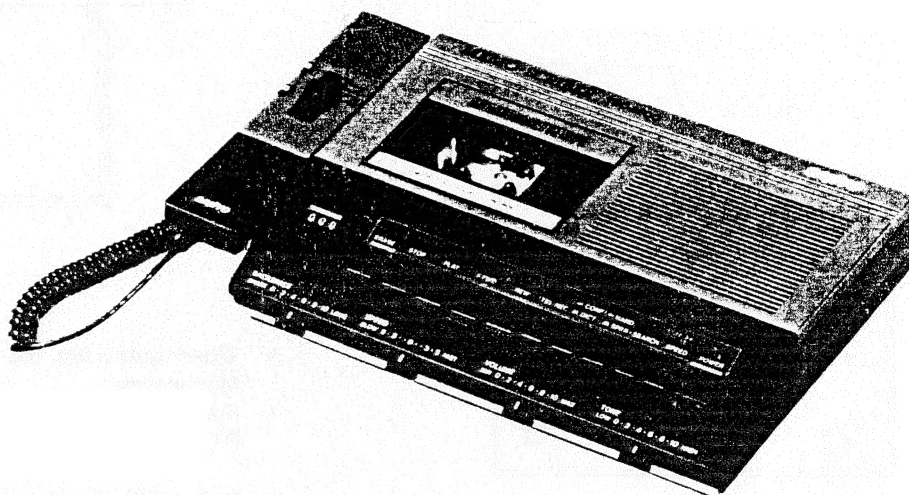


TRC5200 (WEST GERMANY)

MEMO-SCRIBER DICTATING/TRANSCRIBING MACHINE

PRODUCT CODE No.
142 470 02



SPECIFICATIONS

Power Source		Torque	
AC Adaptor	DC 9V	Playback mode	5 ~ 10g-cm
Output Power	1000mW (Max.)	Fast Forward/Rewind mode	more than 25g-cm
Recording System	AC Bias, 1/2 track	Fast Forward Time (at 2.4cm)	120sec. (with MC-60)
Erasing System	DC Erasing	Rewind Time (at 2.4cm)	120sec. (with MC-60)
Erasing Ratio (Over all/2.4cm)	More than 46dB	Backspace Time	
Quick Erasing System	DC Erasing	0	0 sec.
Quick Erase Ratio	More than 50dB	5	2 ~ 3sec.
Frequency Response (Overall)	250Hz ~ 4,000Hz	10	6 ~ 7sec.
Signal to Noise Ratio	more than 35dB	Harmonic Distortion (K3)	less than 10%
Tape Speed		Warning Tone Signal	714Hz
1.2cm	15/32ips. \pm 6%	Index Signal	15Hz
2.4cm	15/16ips. \pm 3%	Terminal Impedance	
Tape Speed Control		TEL. Record	1k Ω
Fast	+20%	Earphone	8 Ω
Slow	-20%	Dimensions	220(W) x 41(H) x 159(D)mm
Wow & Flutter (at 2.4cm)	0.5% RMS	Weight	800g

—Specifications subject to change without notice.—

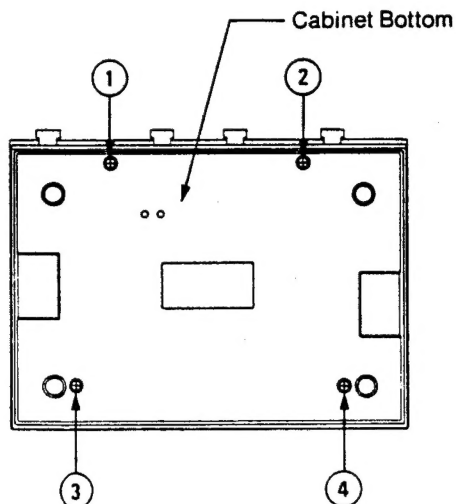
DISASSEMBLY INSTRUCTIONS

GENERAL REMARKS

- Before disassembling the unit, spread a soft rubber mat or a cloth on the workbench to avoid scratches and grease stains.
- Do not spread anything which is likely to cause static electricity because transistors and ICs may be easily damaged by it.
- Reassemble the unit, noting the kinds of screws and the soldering and arrangement of the leads. Refer to "Circuit Diagram and Exploded Views" for correct assembly.
- Reassemble in reverse order.

CABINET TOP REMOVAL

1. Remove the four screws (1 ~ 4) fastening the Cabinet Bottom.
2. Detach the Cabinet Bottom by lifting it from the unit.

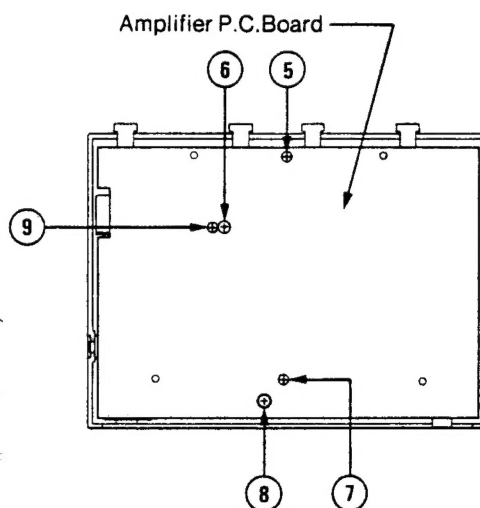


P.C.BOARD AND MECHANISM REMOVAL

- Detach the Cabinet Bottom following instructions.

■ When detaching the P.C.Board only:

1. Remove the four screws (5 ~ 7 and 9) fastening the Amplifier P.C.Board and lift the side of the Volume Controls.
2. Disconnect the connectors of the LED P.C.Board and Head from the Amplifier P.C.Board.
3. Turn over the P.C.Board toward the back of the unit with caution not to damage the lead wires.



■ When detaching the P.C.Board together the Cassette Mechanism:

1. Remove the three screws (5, 6 and 8) fastening the P.C.Board and lift the side of the Volume Control.
2. Disconnect the connector of the LED P.C.Board and turn over the back of the unit with caution not to damage the lead wires.

STANDARD MAINTENANCE

Tape Head and Capstan Cleaning

Periodically clean the tape head, capstan drive shaft and other tape handling surfaces to insure proper tape handling and optimum frequency response. Use a cotton swab dipped in head cleaner or denatured alcohol to clean all tape handling surfaces.

Tape Head Demagnetization

Do not use magnetized tools near the tape head, since they can magnetize the head. After long periods of use, the head will retain a small amount of residual magnetism. A magnetized head will result in loss of high frequency response and increased noise. Use a standard tape head demagnetizer, and follow the instructions supplied with it, to demagnetize the head.

CORRECTION NOTICE



Date: August, 30, 1993

Please add this notice to the Service Manuals listed below.

MEMO-SCRIBER DICTATING/TRANSCRIBING MACHINE

TRC5200

(U.S.A./EUROPE/U.K./GENERAL)

REF:WM-21011/20394/20275/20730

Issue Number 1

The following items were misprinted. Please make the necessary revision as indicated in the Service Manual listed above.

No.	Page or Section		Ref. No.	Parts No.	Description	Q'ty	Remarks
1	Hand Control Parts List Page 23	from	21	141-0-1939-24060	Hand Mic P.C.B. Assy	1	
		to	21	620 124 3246	Protector	1	
2	Hand Control Parts List Page 23	from	22	141-0-4459-45400	Protector	1	
		to	22	620 022 1351	Plug Cord 6P	1	
3	Hand Control Parts List Page 23	from	23	4-2369-76980	Plug Cord 6P	1	
		to	23	620 079 9607	Hand Mic P.C.B. Assy	1	



SANYO Electric Co., Ltd.
OSAKA, JAPAN

August/'93/4,000/H Printed in Japan

REFERENCE No. WM-57230N

SANYO

MEMO-SCRIBER
DECTATING/TRANSCRIBING MACHINE
TRC5200
Date: October,23,1987
(WEST GERMANY) REF: WM-20394 Issue Number 2

No.	Page or Section		Ref. No.	Part No.	Description	Q'ty	Remarks
1	Hand Control Parts List Page 23	from	21	141-0-1939-24060	Hand Mic. P.C.B. Assy	1	
		to	23			1	
2	Hand Control Parts List Page 23	from	22	141-2-4459-45400	Protector	1	
		to	21			1	
3	Hand Control Parts List Page 23	from	23	4-2369-76980	Plug Cord 6P	1	
		to	22			1	

CORRECTION NOTICE



Please add this notice to the Service Manuals listed below.

MEMO-SCRIBER
DECTATING/TRANSCRIBING MACHINE

Date: August,20,1987

TRC5200

(WEST GERMANY)

REF: WM-20394

Issue Number 1

The following items were misprinted. Please make the necessary revisions as indicated in the Service Manuals listed above.

No.	Page or Section		Ref. No.	Part No.	Description	Q'ty	Remarks
1	Cabinet Parts List Page 9 & 11	from	PCB1	141-0-1939-22970	Amplifier P.C.B. Assy	1	
		to	PCB1	141-0-1939-22972	Amplifier P.C.B. Assy	1	
2	P.C.Board List Page 12	from	R24	401 029 9706	CARBON 220 JA 1/8W	1	
		to	R24	4-2219-71560	Resistor type staple	1	
3		from					
		to					

ADJUSTMENTS PROCEDURES

GENERAL REMARKS

- Before attempting to adjust the mechanism of this unit, wipe the tape contacting surfaces (of the pinch roller, Record/Playback head and capstan) clean as well as the contact surfaces of the driving parts (motor pulley, flywheel, belts) with a piece of soft cloth soaked in alcohol. Oil and grease stains may cause trouble.
- Handle the belt carefully because grease easily attaches to it. Then check the used rubber parts. If the rubber has deteriorated or is scratched, replace the parts with new one, also confirm that the contacts of the leaf switch is not deformed.

EQUIPMENT NEEDED

- VTV
 - Frequency counter
 - Dummy load (8Ω)
 - Test tapes
 - 3kHz test tape (Example: Olympus OA-W221) for Tape Speed Adjustment
 - 3kHz test tape (Example: Olympus OA-A211) for Head Azimuth Adjustment
 - Alignment Tool
- Before the electrical adjustments, set the switch and controls as follows:
- Speed switch 2.4cm
 - Backspace control Short
 - Speed control Center (click position)
 - Tone control Max.
 - Volume control Arbitrary

ADJUSTMENT PROCEDURE

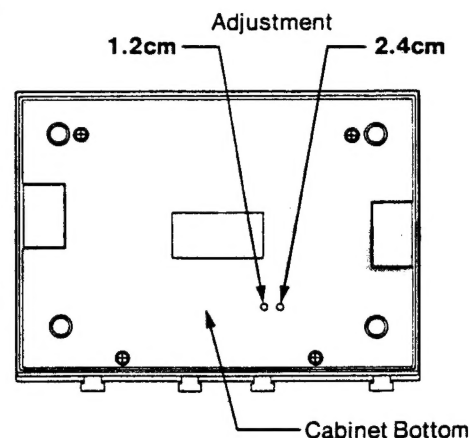
Adjustment Item		Connection	Dummy Load	Measuring Instrument	Test Tape	Adjustment	Measuring Value
Tape Speed	2.4cm	Earphone Jack	8Ω	Frequency Counter	OLYMPUS OA-W221	P201	3,000Hz ±3%
	1.2cm					P202	1,500Hz ±6%
Head Azimuth				VTV	OLYMPUS OA-A211	Azimuth Screw	Maximum

TAPE SPEED ADJUSTMENT

- Set the Tape Speed Switch to 2.4cm or 1.2cm. While playing back the test tape adjust the tape speed by turning the potentiometer (P201 or P202) on the P.C.Board with an alignment tool.

HEAD AZIMUTH ADJUSTMENT

- After the adjustment, secure the adjusting screw with paint or glue.



CIRCUIT DESCRIPTION

POWER SUPPLY

When the POWER switch is turned on, all circuits are supplied with voltage from the AC Adapter. The circuits supplied with voltage are of two types: circuits supplied directly with a voltage of +9V and circuits supplied with a constant-voltage of +5V.

- The circuits supplied directly with a voltage of +9V are:
 - Audio amplifier (IC1)
 - Remote Control Circuit (IC4)
 - Solenoid Drive Circuit

- The circuits supplied with a constant-voltage of +5V are:
 - MPU (Microprocessor unit) IC3
 - Index Signal Record circuit
 - Index Signal Search circuit
 - Rotation Detection circuit
 - Motor Governor circuit

CIRCUIT DESCRIPTION (Continued)

PLAYBACK CIRCUIT

The signal from the tape is played back according to the following process:

Record/Play Head (HD1-1) → Analog Switch (IC2-4) → Pre-amplifier (Pin 9 of IC1 → Pin 6 of IC1) → Tone Control (VR1) → Volume Control (VR2) → Power Amplifier (Pin 4 of IC1 → Pin 1 of IC1) → Earphone Jack (J2) → MIC/Speaker Switch (S8) → Speaker (SP1)

When the PLAY button is pressed, the Pin 40 of IC3 becomes "L" level and when the Hand Control is set to the PLAY mode, 300mV applies to the Pin 8 of IC4, then the Pin 1, 2, 3, 4 and 6 of IC4 become "H", "H", "H", "H" and "L" level. The MPU (IC3) recognizes this two types modes the playback mode and its MPU(IC3) makes the Pin 12 of IC3 "L" level. Therefore, the Q20

and Q21 become "ON" and the Solenoid (SL1) is set to "ON".

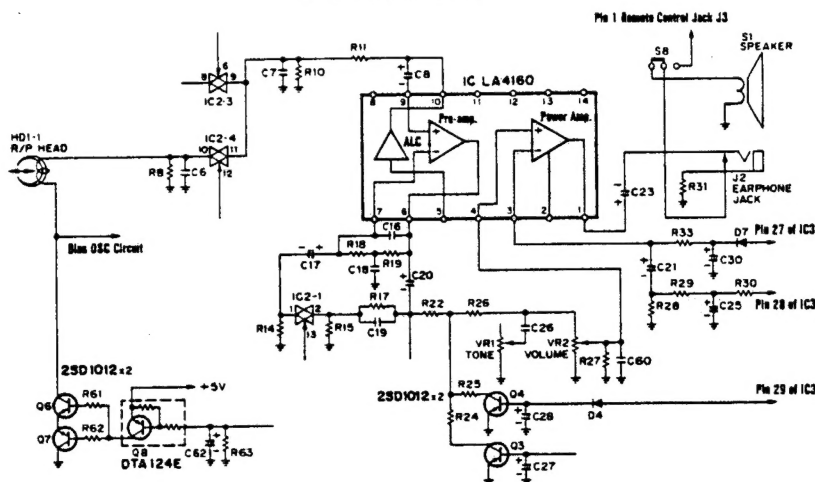
Make the Pin 13 of IC3 "L" level and make revolution the Motor (M1).

Make the Pin 22 of IC3 "L" level and set the Q18 and Q19 to "ON", then operate the Solenoid (SL1). After that, make the Pin 12 of IC3 "H" level and set the Q20 and Q21 to "OFF". The electric current of consumption will be cut down.

The MPU (IC3) makes the Pin 16, 17 and 19 of IC3 "H", "L" and "H" level and the Audio Amplifier will be operated.

The Analog Switch (IC2-1) goes ON so that the equalizer and gain of the Pre-amplifier becomes the constant of R14, R15, R16, R17 and C19. The Muting Circuit operates because Pin 15 of IC3 becomes "H" level and Q6, Q7 and Q8 go ON.

PLAYBACK CIRCUIT



RECORDING CIRCUIT

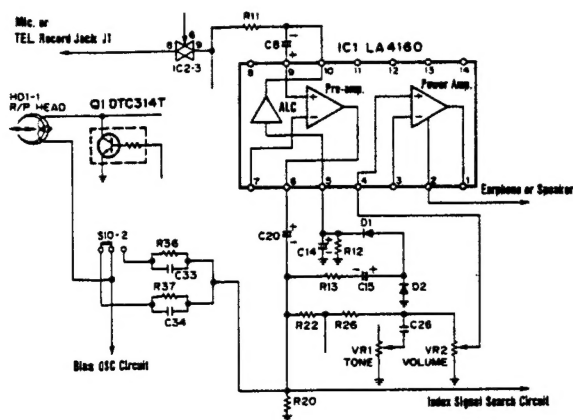
The signal from the Microphone or the TEL. Record Jack (J1) is recorded on the tape according to the following process:

Mic. or TEL. REC. Jack (J1) → Analog Switch (IC2-3) → Pre-amplifier (Pin 9 of IC1 → Pin 6 of IC1) → Record Equalizer (R36 & C33, R27 & C34) → Record/Play Head (HD1-1)

When the hand control is set to DICTATE, the Q33 become "ON" and no monitoring is made because the Volume Control (VR2) is muted.

In the TEL. Record mode, however, as the TEL REC switch (S6-1) is set the "ON", the jack switch (16) becomes "OFF" when the earphone is plugged in, and the Pin 3 of IC1 becomes "L" level. Therefore, monitoring is made through the earphone.

RECORDING CIRCUIT



While recording, the Pin 15 of IC3 becomes "L" level and the Bias OSC circuit, muting circuit and LED (DICTATE) drive circuit operate because the Q22 becomes "ON".

INDEX SIGNAL RECORDING

If the INDEX button is pressed with the hand control set to DICTATE in the record mode, the Index Signal is recorded on the tape in the following process:

Pin 18 of IC3 → Q12 → Q11 → Record/Play Head (HD1-1)

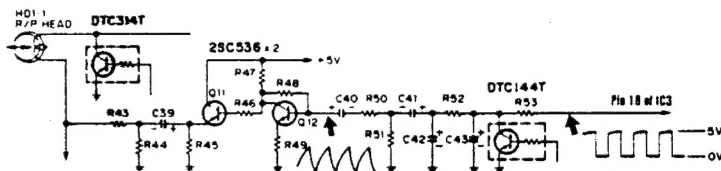
When the hand control is set to DICTATE, 500mV applied the Pin 8 of IC4 and the Pin 1, 2, 3, 4 and 6 voltage level of IC4 become "H", "H", "L", "L" and "L" level. Then the MPU (IC3) recognizes the DICTATE mode and the same condition will be made described in the RECORDING CIRCUIT.

When the INDEX button is pressed, the Pin 34 of IC3 becomes "L" level, and 15Hz rectangular wave for 1.5 second as an Index Signal produces from the Pin 18 of IC3.

This signal goes through the Low Pass Filter (R53, C43, R52, C42, C41, R50, R51 and C40) and its signal becomes triangle wave and it is amplified by the Q12 and Q11. Then the signal is recorded on the tape by the Record/Play Head (HD1-1). At the

CIRCUIT DESCRIPTION (Continued)

INDEX SIGNAL RECORDING



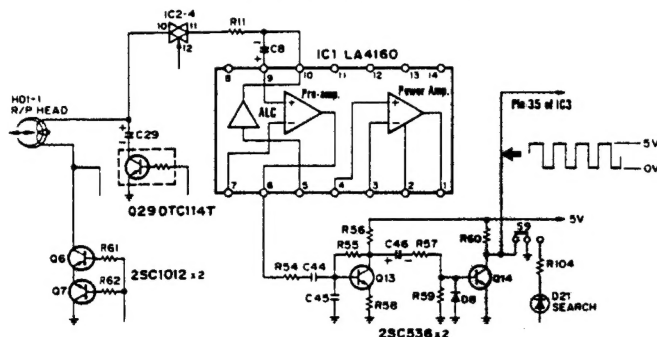
same time, the Alarm Signal is output through the Pin 28 of IC3. Then the Pin 17 of IC 3 becomes "L" level and the Analog Switch (IC2-3) becomes "OFF". Therefore, the voice signal is not recorded.

INDEX SIGNAL SEARCH (F.Forwarding & Rewinding)

The INDEX Signal recorded on the tape is played back according to the following process:

Record/Play Head (HD1-1) → Analog Switch (IC2-4) → Pre-amplifier (Pin 9 of IC1 → Pin 6 of IC1) → Q13 → Q14

INDEX SIGNAL SEARCH



When the unit is in the fast forwarding and rewinding mode, the Pin 16 of IC3 becomes "OFF" and the Analog Switch (IC2-1) becomes "OFF" so that the equalizer of the Pre-amplifier becomes in the same mode as the recording mode.

The MPU (IC3) measures the signal from the collector terminal of Q14. When this signal indicates between 100Hz and 600Hz, the MPU recognizes it as the INDEX signal.

Then the MPU (IC3) makes the Pin 13 and Pin 14 of IC3 "OFF" for about 1 second and it makes the motor stop temporarily. During that mode, the Alarm Signal is output through the Pin 28 of IC3.

ALARM SIGNAL

The Alarm Signal produces continuously about 714Hz rectangular wave from Pin 28 of IC3 (MPU).

This signal becomes a triangle wave after going through R30, R25 and C29, and enters into Pin 3 of IC1.

And then, this signal is amplified by the Power Amplifier (IC1) and comes out from the speaker as the Alarm sound.

There are the following types of the Alarm Signals.

1. No Cassette Alarm

Sounds continuously while pressing one of the buttons

2. ASO Alarm

Sounds continuously with Tape End

3. Recording Protection Alarm

Sounds continuously while pressing the button (TEL REC/DICTATE)

4. Tape Near End Alarm

0.5 sec. 4 times
• 1.2cm approx. 5 min. before
• 2.4cm approx. 3 min. before

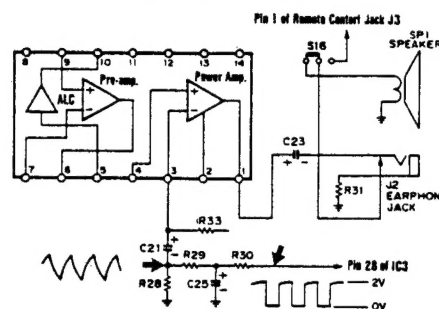
5. Index Signal Record

1.5 sec. (approx.)

6. Index Signal Search

1.0 sec. (approx.)

ALARM SIGNAL



BACKSPACE CONTROL

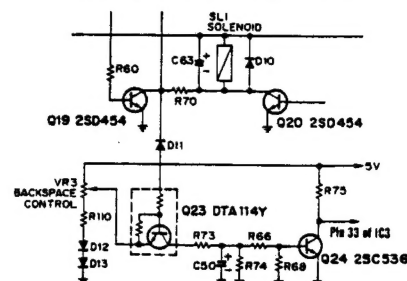
When the PLAY pedal on the Foot Control is pressed, 900mV applies the Pin 8 of IC3 and the MPU (IC3) recognizes PLAYBACK mode.

When the Solenoid becomes "ON", Q23 becomes "ON" and C50 is charged with the voltage which corresponds to the electrical potential of the Backspace Control (VR3).

Only When PLAY switch of the Foot Control is released, 700mV applies to the Pin 8 of IC4 and the Pin 1, 2, 3, 4 and 6 of IC4 become "H", "H", "H", "L" and "L" level. Therefore, the MPU (IC3) makes the Pin 22 of IC3 "H" level and makes the Solenoid (SL1) and Q23 "OFF". The Q24 keeps the "ON" mode while C50 is discharging. At same time, the MPU (IC3) makes the Pin 13 of IC3 "H" level, Pin 14 "L" level, the motor turn its course and the unit rewind.

The MPU (IC3) reads in the electrical potential of the collector terminal of Q24 by Pin 33 of IC3.

BACKSPACE CONTROL



CIRCUIT DESCRIPTION (Continued)

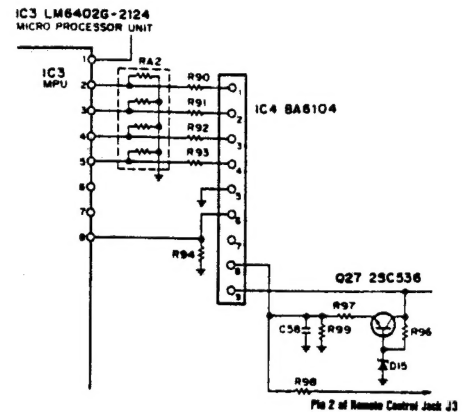
REMOTE CONTROL

By pressing the Hand Control or the Foot Control Switch, the input voltage of Pin 8 of IC4 and each voltage of Pin 1, 2, 3, 4 and 6 of IC4 becomes as shown in the diagram below.

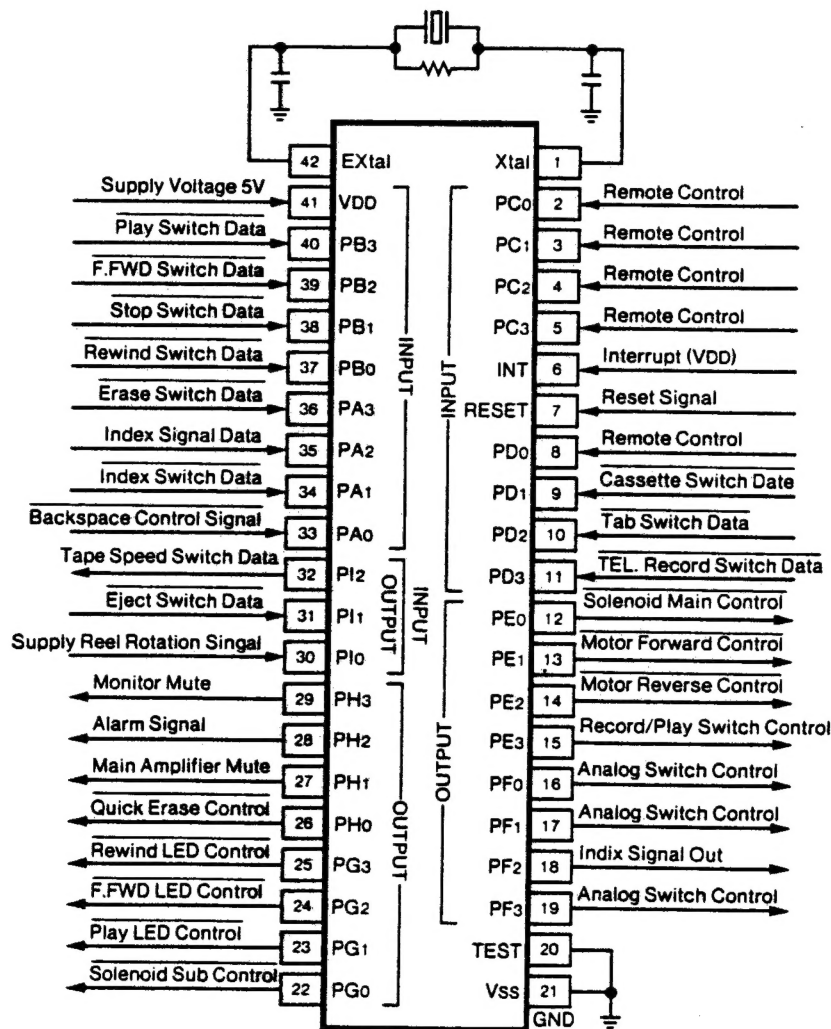
Function	Pin 8	Pin 6	Pin 4	Pin 3	Pin 2	Pin 1
No Operation	1,300mV	H	H	H	H	H
Play	900mV	L	H	H	H	H
Backspace	700mV	L	L	H	H	H
Dictate	500mV	L	L	L	H	H
F.Forward	300mV	L	L	L	L	H
Back	0mV	L	L	L	L	L
Index	500mV	L	L	L	H	H

MPU (IC3) reads in the output of IC4 and each voltage of Pin 1, 2, 3, 4 and 6, and then it performs the operations (PLAY, BACKSPACE, INDEX producing, DICTATE, F.FWD and BACK).

REMOTE CONTROL



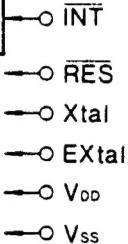
MICROPROCESSOR UNIT (IC3) PORT FORMAT



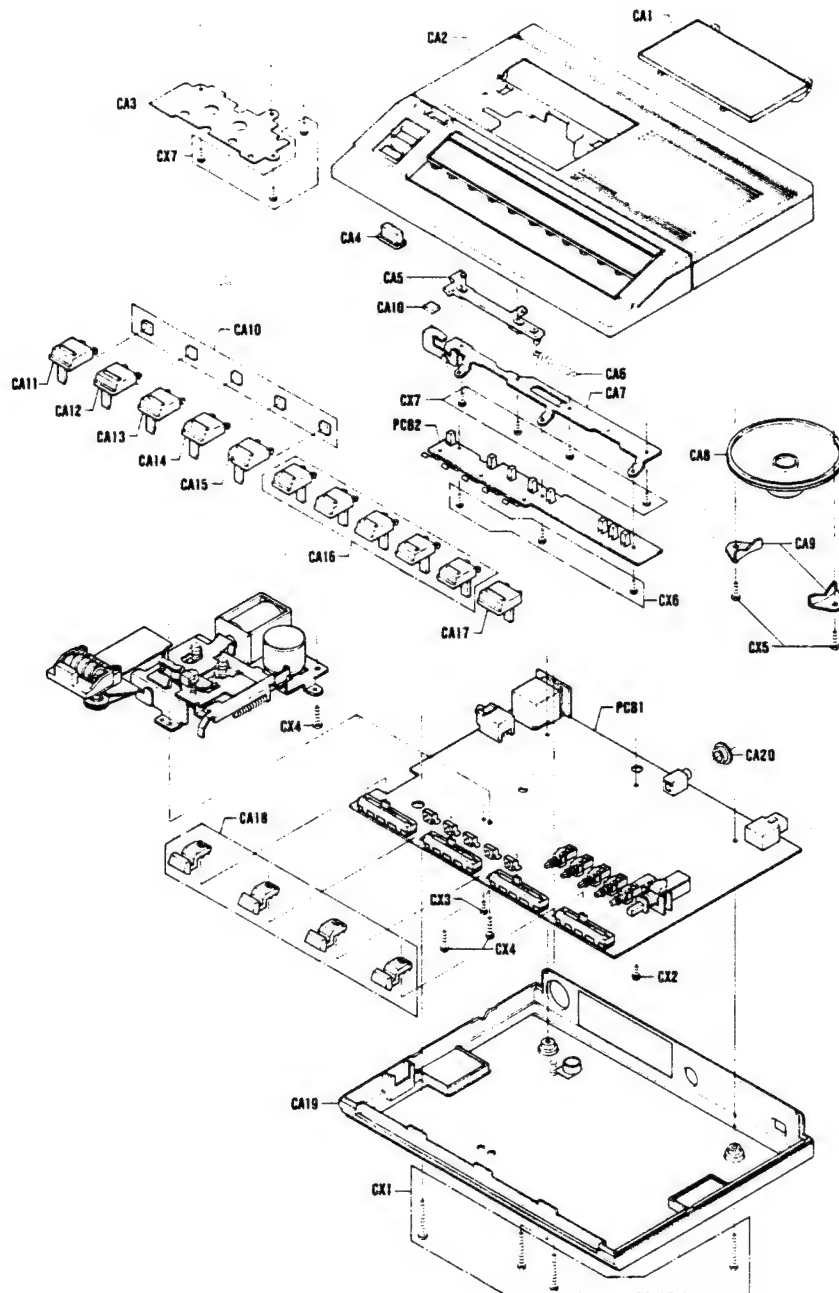
NOTE:

The signals with lines down above their names show that they are active in **LOW** level.

(MICROPROCESSOR UNIT IC3)



CABINET EXPLODED VIEW



PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
PACKAGE				ACCESSORIES			
	141-6-1419-97900	Individual Carton	1	†	4-1929-70310	Hand Control (HM-52)	1
	141-6-1429-16300	Accessory Box	1		4-2419-74066	Microcassette	1
	141-6-1469-29000	Pad Left	1		141-0-2149-05100	Holder Handset Assy	1
	141-6-1469-29100	Pad Right	1		142-6-4119-33646	Instruction Book	1
	141-6-2519-08017	Poly Cover 80 x 170 (Holder)	1				
	141-6-2519-10790	Poly Cover (Unit)	1				
	141-6-4559-00100	Serial No. Sheet	2				

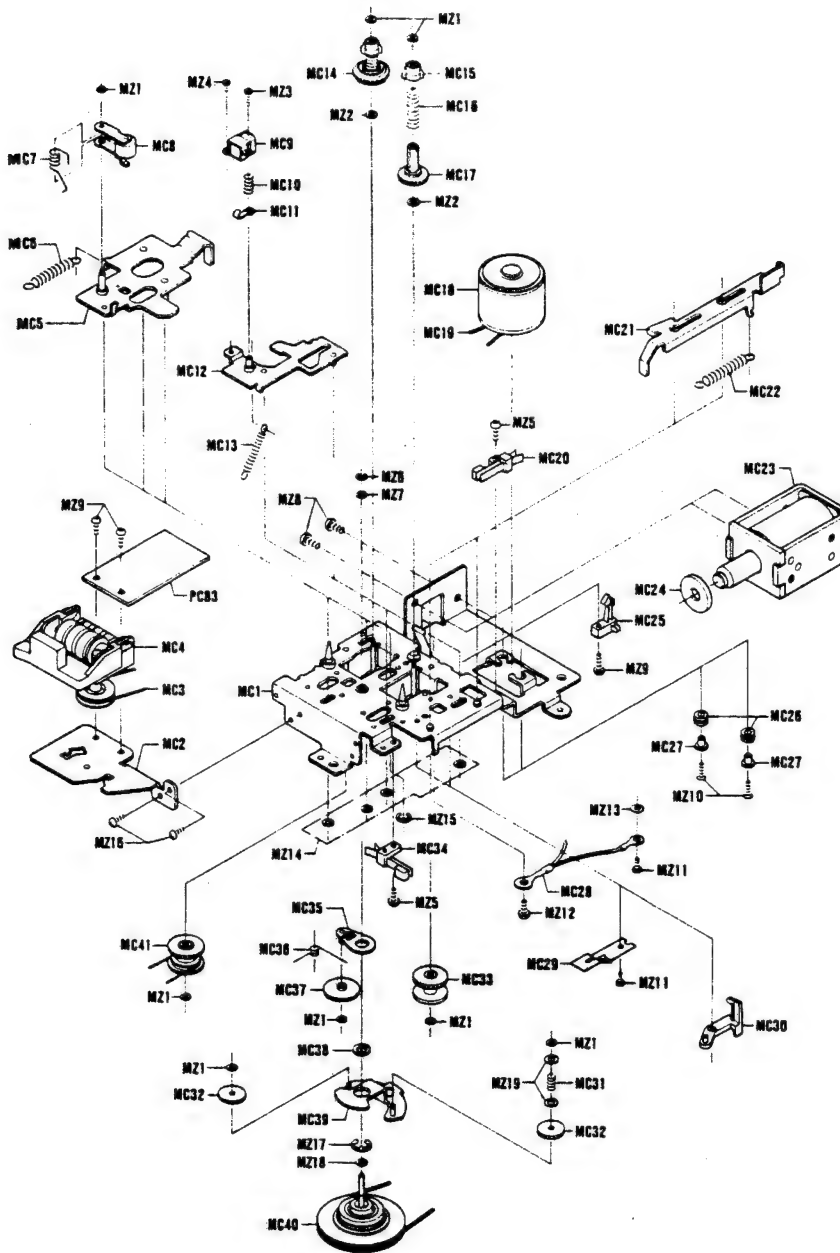
PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
CABINET				CA18	141-2-1649-52900	Knob Slide	4
	141-2-4469-17201	Cushion (Wire Arrangement)	1	CA19	141-0-1129-31402	Cabinet Bottom Assy	1
CN3	4-2352-02887	Connector 2P Assy (Speaker)	1	CA20	141-2-1539-10701	Plate Jack	1
CA 1	141-0-1249-47000	Lid Cassette Assy	1	PCB1	141-0-1939-22970	Amplifier P.C.B. Assy	1
CA 2	141-0-1129-31300	Cabinet Top Assy	1	PCB2	141-0-1939-24820	LED P.C.B. Assy	1
CA 3	141-2-3129-06800	Panel Chassis	1	CX1	411 023 5602	SCR S-TPG PAN 3X18	4
CA 4	141-2-1659-94100	Button Eject	1	CX2	411 003 8809	SCR PAN+SW 2.6X6	1
CA 5	141-2-7439-56800	Plate Lock Lid	1	CX3	411 040 2303	SCR PAN 2.6X5	1
CA 6	141-2-8549-43400	Spring	1	CX4	411 023 4508	SCR S-TPG PAN 3X12	3
CA 7	141-0-3779-00800	Bracket LED Assy	1	CX5	411 023 9800	SCR S-TPG PAN 3X8	2
CA 8	4-1519-73150	Speaker (SP1/811)	1	CX6	411 039 0105	SCR PAN 2X3	3
CA 9	141-2-3729-00801	Bracket Fix Speaker	2	CX7	411 022 7500	SCR S-TPG PAN 2X4	7
CA10	141-2-4459-42700	Sheet	6	NOTES:			
CA11	141-2-1659-93800	Button Erase	1	1. Parts order must contain Model Number, Part Number and Description.			
CA12	141-2-1659-93400	Button Stop	1	2. Ordering quantity of screws and resistors must be multiple of 10 pcs.			
CA13	141-2-1659-93500	Button Play	1				
CA14	141-2-1659-93600	Button FF	1				
CA15	141-2-1659-93700	Button REW	1				
CA16	141-2-1659-94000	Button	5				
CA17	141-2-1659-93900	Button Power	1				

MECHANISM PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
CASSETTE MECHANISM				MC22	141-2-8549-38600	Spring Rod Base	1
	141-2-4469-17201	Cushion (Wire Arrangement)	1	MC23	4-2649-70870	Plunger (SL1)	1
CN4	4-2352-02822	Connector 5P Assy	1	MC24	141-2-4459-43300	Damper	1
CN5	4-2352-03200	Connector 4P Assy	1	MC25	4-2319-75860	Leaf Switch (S13/Cassette)	1
CN7	4-2352-03163	Connector 2P Assy	1	MC26	141-2-4459-27001	Cushion	2
MC 1	141-0-3119-28100	Chassis Assy	1	MC27	141-2-3529-33200	Spacer Cushion Motor	2
MC 2	141-2-8139-13400	Bracket Counter	1	MC28	4-2379-71360	Lug Wire Assy	1
MC 3	141-2-5649-31200	Belt Counter	1	MC29	141-2-8539-62200	SPG Lock	1
MC 4	141-2-8119-12101	Counter	1	MC30	141-0-7439-21200	Arm Interlock Assy	1
MC 5	141-0-7319-36500	Base Slide Assy	1	MC31	141-2-8559-19200	SPG Friction	1
MC 6	141-2-8549-43300	Spring Base	1	MC32	141-2-5519-75000	Gear FF REW	2
MC 7	141-2-8529-20800	SPG Pinch Roller	1	MC33	141-0-5519-16300	Gear Reflector Assy	1
MC 8	141-0-5459-02601	Arm Pinch Roller Assy	1	MC34	4-2319-71863	Leaf Switch (S12/Eject)	1
MC 9	4-2429-73290	R/P/E Head (HD1)	1	MC35	141-0-5559-08200	Swing Arm Play Assy	1
MC10	141-2-8519-82900	Spring Azimuth	1	MC36	141-2-8529-43200	Spring Play	1
MC11	141-2-4729-11700	Lug	1	MC37	141-2-5519-75100	Gear Play	1
MC12	141-0-7319-36600	Plate Head Assy	1	MC38	141-2-3529-56100	Spacer	1
MC13	141-2-8549-45200	Spring Rod	1	MC39	141-0-5559-08100	Swing Arm F/R Assy	1
MC14	141-0-5319-10100	Gear FF Reel Assy	1	MC40	141-0-5219-16700	Flywheel Compl	1
MC15	141-2-5369-07900	Cap Supply Reel	1	MC41	141-2-5519-74900	Gear Counter	1
MC16	141-2-8559-19500	Spring Backtention	1	PCB3	141-0-1939-25940	Sub P.C.B. Assy	1
MC17	141-2-5319-19300	Gear REW Reel	1	MZ 1	141-2-4539-17500	Washer, M1.25x3.0x0.25	8
MC18	4-5279-71362	Motor (M1)	1	MZ 2	141-2-4539-27603	Washer, M2.1x3.5x0.25	2
MC19	141-2-5649-30800	Belt Drive	1	MZ 3	411 019 5601	SCR PAN PCS 1.4X4	1
MC20	4-2319-75820	Leaf Switch (S14/Tab)	1				
MC21	141-2-7319-88500	Plate Lid	1				

MECHANISM EXPLODED VIEW



MECHANISM PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
MZ 4	411 019 3201	SCR PAN PCS 1.4X1.6	1	MZ16	411 097 9300	SCR PAN PCS 2X3	2
MZ 5	411 002 5908	SCR PAN 2.6X4	2	MZ17	411 016 2405	RING E 3.2	1
MZ 6	411 015 6800	RING E 1.2	1	MZ18	141-2-4539-40500	Washer, M1.5x3.5x0.13	1
MZ 7	141-2-4539-30100	Washer, M1.6x3.0x0.25	1	MZ19	141-2-4539-08601	Washer, M2.1x4.0x0.25	2
MZ 8	411 041 3309	SCR PAN 3X3	2	MZ20	411 039 1508	SCR PAN 2X5	2
MZ 9	411 020 3801	SCR PAN PCS 2X5	1				
MZ10	411 017 4804	SCR FLT PCS 1.7X1.6	2				
MZ11	411 019 8503	SCR PAN PCS 1.7X1.6	2				
MZ12	411 040 0507	SCR PAN 2.6X3	1				
MZ13	141-2-4569-10100	Washer, M1.25x3.6x0.3	1				
MZ14	141-2-4539-27800	Washer, M1.6x3.2x0.25	4				
MZ15	411 015 9603	RING E 2.3	1				

NOTES:

- Parts order must contain Model Number, Part Number and Description.
- Ordering quantity of screws and resistors must be multiple of 10 pcs.

P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
AMPLIFIER P.C.B. ASSY				IC2	409 020 8704	IC LC4066B	1
PCB1	141-0-1939-22970	Amplifier P.C.B. Assy	1	IC3	409 119 9704	IC LM6402G-2124	1
	141-2-8559-21100	SPG Hook	1	IC4	409 002 9309	IC BA6104	1
	141-2-1749-02600	Foot	1	IC201	409 018 2202	IC LA5522	1
	300-3-1000-19000	Staple, 5mm	31	PC1	407 060 8401	PHOTO COUPLE ON2170Q	1
CN 1	4-2369-74890	Plug 2P	1	Q1	405 059 9309	TR DTC314-TS-TP	1
CN 2	4-2369-74890	Plug 2P	1	Q2	405 021 0204	TR 2SD1012-F-SPA-AC	1
CN 3	4-2369-74890	Plug 2P	1	Q3	405 021 0204	TR 2SD1012-F-SPA-AC	1
CN 4	4-2369-74910	Plug 5P	1	Q4	405 021 0204	TR 2SD1012-F-SPA-AC	1
CN 5	4-2369-75100	Plug 4P	1	Q5	405 034 6804	TR DTA114-ES-TP	1
CN 6	4-2369-75940	Plug 9P	1	Q6	405 021 0204	TR 2SD1012-F-SPA-AC	1
CN 7	4-2369-74890	Plug 2P	1	Q7	405 021 0204	TR 2SD1012-F-SPA-AC	1
CR 1	4-2539-70711	CSB-400P Resonator	1	Q8	405 059 9408	TR DTA124-ES-TP	1
J1	4-2359-73470	1P Jack (TEL REC)	1	Q9	405 019 1909	TR 2SC536-E-NP	1
J2	4-2352-02920	Jack 3P (Earphone) (w/S16)	1	Q10	405 034 6804	TR DTA114-ES-TP	1
J3	4-2359-76160	DIN 6P Socket (Remote Control) (w/S15)	1	Q11	405 019 1909	TR 2SC536-E-NP	1
J4	4-2352-02910	Ext. Power Jack	1	Q12	405 019 1909	TR 2SC536-E-NP	1
S 1	4-2319-75790	Touch Switch (Erase)	1	Q13	405 019 1909	TR 2SC536-E-NP	1
S 2	4-2319-75790	Touch Switch (Stop)	1	Q14	405 019 1909	TR 2SC536-E-NP	1
S 3	4-2319-75790	Touch Switch (Play)	1	Q15	405 004 4700	TR 2SA608-F-SP	1
S 4	4-2319-75790	Touch Switch (F.FWD)	1	Q16	405 021 0204	TR 2SD1012-F-SPA-AC	1
S 5	4-2319-75790	Touch Switch (Rewind)	1	Q17	405 034 6804	TR DTA114-ES-TP	1
S 6	4-2319-75712	Push Switch (TEL REC.)	1	Q18	405 034 6804	TR DTA114-ES-TP	1
S 7	4-2319-75712	Push Switch (Conf./Dict.)	1	Q19	405 024 0102	TR 2SD545-E-NP	1
S 8	4-2319-75712	Push Switch (Speaker/Hand)	1	Q20	405 024 0102	TR 2SD545-E-NP	1
S 9	4-2319-75712	Push Switch (Search)	1	Q21	405 034 6804	TR DTA114-ES-TP	1
S10	4-2319-75900	Push Switch (Speed)	1	Q22	405 034 6804	TR DTA114-ES-TP	1
S11	4-2312-06450	Power Switch	1	Q23	405 034 7306	TR DTA114-YS-AUTO	1
T 1	4-2589-73650	OSC Trans	1	Q24	405 019 1909	TR 2SC536-E-NP	1
P201	4-2229-76133	Potentiometer (B-220Ω)	1	Q25	405 004 4700	TR 2SA608-F-SP	1
P202	4-2229-76139	Potentiometer (B-2.2kΩ)	1	Q26	405 059 9507	TR DTC114-TS-TP	1
VR 1	4-2229-77330	Slide Volume (A-10kΩ/Tone)	1	Q27	405 019 1909	TR 2SC536-E-NP	1
VR 2	4-2229-77330	Slide Volume (A-10kΩ/Volume)	1	Q28	405 024 4100	TR 2SD612-E	1
VR 3	4-2229-77340	Slide Volume (B-10kΩ/Backspace)	1	Q29	405 060 6304	TR DTC144-TS-TP	1
VR 4	4-2229-77350	Slide Volume (B-10kΩ/Speed)	1	Q30	405 034 6804	TR DTA114-ES-TP	1
D1	407 008 0405	DIODE GMB01-BT	1	Q33	405 021 0204	TR 2SD1012-F-SPA-AC	1
D2	407 077 3109	DIODE SB0015-03A	1	Q34	405 060 6304	TR DTC144-TS-TP	1
D3	407 008 0405	DIODE GMB01-BT	1	Q201	405 021 0204	TR 2SD1012-F-SPA-AC	1
D4	407 008 0405	DIODE GMB01-BT	1	Q202	405 021 0204	TR 2SD1012-F-SPA-AC	1
D5	407 008 0405	DIODE GMB01-BT	1	Q203	405 021 0204	TR 2SD1012-F-SPA-AC	1
D6	407 008 0405	DIODE GMB01-BT	1	Q204	405 009 5108	TR 2SB926-T	1
D7	407 008 0405	DIODE GMB01-BT	1	Q205	405 009 5108	TR 2SB926-T	1
D8	407 008 0405	DIODE GMB01-BT	1	Q206	405 024 0102	TR 2SD545-E-NP	1
D9	407 008 0405	DIODE GMB01-BT	1	Q207	405 024 0102	TR 2SD545-E-NP	1
D10	407 008 0405	DIODE GMB01-BT	1	Q208	405 024 0102	TR 2SD545-E-NP	1
D11	407 008 0405	DIODE GMB01-BT	1	C1	403 060 8106	POLYESTER 0.033U J 50V	1
D12	407 008 0405	DIODE GMB01-BT	1	C2	403 001 1203	CERAMIC 0.022U N 6V	1
D13	407 008 0405	DIODE GMB01-BT	1	C3	403 038 7209	ELECT 220U M 6.3V	1
D14	407 008 0405	DIODE GMB01-BT	1	C4	403 001 2309	CERAMIC 0.01U N 16V	1
D15	407 050 6608	ZENER DIODE GZA6.8Y	1	C5	403 001 2309	CERAMIC 0.01U N 16V	1
D16	407 050 5502	ZENER DIODE GZA5.6Y-BT	1	C6	403 069 1207	CERAMIC 1000P K 50V	1
D17	407 077 3109	DIODE SB0015-03A	1	C7	403 001 8905	CERAMIC 6800P M 16V	1
D18	407 077 3109	DIODE SB0015-03A	1	C8	403 047 1809	ELECT 4.7U M 25V	1
D27	407 077 3109	DIODE SB0015-03A	1	C9	403 069 1207	CERAMIC 1000P K 50V	1
D28	407 008 0405	DIODE GMB01-BT	1	C10	403 040 4807	ELECT 220U M 10V	1
D29	407 008 0405	DIODE GMB01-BT	1	C11	403 041 5902	ELECT 470U M 10V	1
D30	407 008 0405	DIODE GMB01-BT	1	C12	403 042 0807	ELECT 10U M 16V	1
D31	407 008 0405	DIODE GMB01-BT	1	C13	403 009 1809	CERAMIC 10P J 50V	1
D32	407 008 0405	DIODE GMB01-BT	1	C14	403 040 8805	ELECT 33U M 10V	1
D33	407 008 0405	DIODE GMB01	1	C15	403 047 9904	ELECT 0.1U M 50V	1
D34	407 008 0405	DIODE GMB01	1	C16	403 068 9402	CERAMIC 100P K 50V	1
D201	407 008 0405	DIODE GMB01-BT	1	C17	403 040 3008	ELECT 22U M 10V	1
D202	407 050 5502	ZENER DIODE GZA5.6Y-BT	1	C18	403 074 6303	CERAMIC 560P K 50V	1
IC1	409 017 5105	IC LA4160	1	C19	403 060 3002	POLYESTER 0.027U K 50V	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
C20	403 047 1809	ELECT 4.7U M 25V	1	R11	401 030 0204	CARBON 2.2K JA 1/8W	1
C21	403 047 1809	ELECT 4.7U M 25V	1	R12	401 031 7707	CARBON 470K JA 1/8W	1
C22	403 039 8106	ELECT 100U M 10V	1	R13	401 029 9706	CARBON 220 JA 1/8W	1
C23	403 038 7209	ELECT 220U M 6.3V	1	R14	401 031 9602	CARBON 56 JA 1/8W	1
C24	403 067 6204	MT-COMPO 0.15U J 50V	1	R15	401 031 6601	CARBON 4.7K JA 1/8W	1
C25	403 047 9904	ELECT 0.1U M 50V	1	R16	401 032 4606	CARBON 6.8K JA 1/8W	1
C26	403 062 7503	POLYESTER 0.056U K 50V	1	R17	401 030 0709	CARBON 22K JA 1/8W	1
C27	403 047 9904	ELECT 0.1U M 50V	1	R18	401 032 5108	CARBON 68K JA 1/8W	1
C28	403 047 9904	ELECT 0.1U M 50V	1	R19	401 032 5108	CARBON 68K JA 1/8W	1
C29	403 041 3700	ELECT 47U M 10V	1	R20	401 028 3200	CARBON 1K JA 1/8W	1
C30	403 047 1809	ELECT 4.7U M 25V	1	R21	401 028 3200	CARBON 1K JA 1/8W	1
C31	4-2239-70760	Capacitor CI 0.2U Z 12V	1	R22	401 031 6601	CARBON 4.7K JA 1/8W	1
C32	403 043 8109	ELECT 3300U M 16V	1	R24	401 029 9706	CARBON 220 JA 1/8W	1
C33	403 001 8905	CERAMIC 6800P M 16V	1	R25	401 030 8200	CARBON 33 JA 1/8W	1
C34	403 058 3106	POLYESTER 0.015U J 50V	1	R26	401 028 3200	CARBON 1K JA 1/8W	1
C35	403 082 5503	POLYPRO 8200P J 100V	1	R27	401 030 9702	CARBON 33K JA 1/8W	1
C36	403 001 2309	CERAMIC 0.01U N 16V	1	R28	401 031 8605	CARBON 51 JA 1/8W	1
C37	403 001 2309	CERAMIC 0.01U N 16V	1	R29	401 029 1502	CARBON 15K JA 1/8W	1
C38	403 042 0807	ELECT 10U M 16V	1	R30	401 028 3705	CARBON 10K JA 1/8W	1
C39	403 039 3200	ELECT 47U M 6.3V	1	R31	401 031 9602	CARBON 56 JA 1/8W	1
C40	403 049 2002	ELECT 1U M 50V	1	R33	401 032 4606	CARBON 6.8K JA 1/8W	1
C41	403 049 2002	ELECT 1U M 50V	1	R34	401 030 0204	CARBON 2.2K JA 1/8W	1
C42	403 047 1809	ELECT 4.7U M 25V	1	R35	401 031 6601	CARBON 4.7K JA 1/8W	1
C43	403 047 1809	ELECT 4.7U M 25V	1	R36	401 029 1502	CARBON 15K JA 1/8W	1
C44	403 060 8106	POLYESTER 0.033U J 50V	1	R37	401 029 1502	CARBON 15K JA 1/8W	1
C45	403 001 1203	CERAMIC 0.022U N 6V	1	R38	401 029 0406	CARBON 150 JA 1/8W	1
C46	403 049 2002	ELECT 1U M 50V	1	R39	401 028 3705	CARBON 10K JA 1/8W	1
C47	403 089 7104	TA-SOLID 0.68U M 6.3V	1	R40	401 032 3500	CARBON 68 JA 1/8W	1
C48	403 042 0807	ELECT 10U M 16V	1	R41	401 031 6106	CARBON 470 JA 1/8W	1
C49	403 039 3200	ELECT 47U M 6.3V	1	R42	401 028 6607	CARBON 120 JA 1/8W	1
C50	403 040 8805	ELECT 33U M 10V	1	R43	401 030 9207	CARBON 3.3K JA 1/8W	1
C51	403 069 1207	CERAMIC 1000P K 50V	1	R44	401 028 8106	CARBON 120K JA 1/8W	1
C52	4-2239-70760	Capacitor CI 0.2U Z 12V	1	R45	401 028 3200	CARBON 1K JA 1/8W	1
C53	403 040 4807	ELECT 220U M 10V	1	R46	401 031 7202	CARBON 47K JA 1/8W	1
C54	403 071 6207	CERAMIC 220P K 50V	1	R47	401 028 3705	CARBON 10K JA 1/8W	1
C55	403 071 6207	CERAMIC 220P K 50V	1	R48	401 028 4702	CARBON 1M JA 1/8W	1
C56	403 042 0807	ELECT 10U M 16V	1	R49	401 028 3200	CARBON 1K JA 1/8W	1
C57	403 049 2002	ELECT 1U M 50V	1	R50	401 028 3705	CARBON 10K JA 1/8W	1
C58	4-2239-70760	Capacitor CI 0.2U Z 12V	1	R51	401 028 4207	CARBON 100K JA 1/8W	1
C59	403 039 3200	ELECT 47U M 6.3V	1	R52	401 028 3705	CARBON 10K JA 1/8W	1
C60	403 001 2309	CERAMIC 0.01U N 16V	1	R53	401 028 3705	CARBON 10K JA 1/8W	1
C61	403 001 2309	CERAMIC 0.01U N 16V	1	R54	401 032 5108	CARBON 68K JA 1/8W	1
C62	403 038 7209	ELECT 220U M 6.3V	1	R55	401 028 4702	CARBON 1M JA 1/8W	1
C63	403 042 0807	ELECT 10U M 16V	1	R56	401 028 3705	CARBON 10K JA 1/8W	1
C64	403 039 8106	ELECT 100U M 10V	1	R57	401 028 3705	CARBON 10K JA 1/8W	1
C65	403 001 2309	CERAMIC 0.01U N 16V	1	R58	401 030 3700	CARBON 220 JA 1/8W	1
C66	403 001 2309	CERAMIC 0.01U N 16V	1	R59	401 030 0709	CARBON 22K JA 1/8W	1
C67	403 047 1809	ELECT 4.7U M 25V	1	R60	401 030 0709	CARBON 22K JA 1/8W	1
C68	403 001 1203	CERAMIC 0.022U N 6V	1	R61	401 028 3200	CARBON 1K JA 1/8W	1
C69	403 039 8106	ELECT 100U M 10V	1	R62	401 028 3200	CARBON 1K JA 1/8W	1
C70	403 069 1207	CERAMIC 1000P K 50V	1	R63	401 028 3200	CARBON 1K JA 1/8W	1
C201	403 042 0807	ELECT 10U M 16V	1	R64	401 031 1903	CARBON 390 JA 1/8W	1
C202	403 067 6204	MT-COMPO 0.15U J 50V	1	R65	401 031 7202	CARBON 47K JA 1/8W	1
C203	403 001 2309	CERAMIC 0.01U N 16V	1	R66	401 028 3705	CARBON 10K JA 1/8W	1
R1	401 031 6601	CARBON 4.7K JA 1/8W	1	R67	401 029 3902	CARBON 18 JA 1/8W	1
R2	401 031 6601	CARBON 4.7K JA 1/8W	1	R68	401 030 0709	CARBON 22K JA 1/8W	1
R3	401 031 6601	CARBON 4.7K JA 1/8W	1	R69	401 028 3200	CARBON 1K JA 1/8W	1
R4	401 030 0204	CARBON 2.2K JA 1/8W	1	R70	401 099 4106	OXIDE-MT 12 JB 2W	1
R5	401 028 3200	CARBON 1K JA 1/8W	1	R71	401 028 3200	CARBON 1K JA 1/8W	1
R6	401 028 4207	CARBON 100K JA 1/8W	1	R72	401 028 3705	CARBON 10K JA 1/8W	1
R7	401 028 3200	CARBON 1K JA 1/8W	1	R73	401 028 3200	CARBON 1K JA 1/8W	1
R8	401 028 4207	CARBON 100K JA 1/8W	1	R74	401 028 3705	CARBON 10K JA 1/8W	1
R9	401 028 3200	CARBON 1K JA 1/8W	1	R75	401 030 0709	CARBON 22K JA 1/8W	1
R10	401 030 0709	CARBON 22K JA 1/8W	1	R76	401 032 0103	CARBON 560 JA 1/8W	1

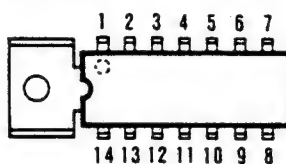
P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
R77	401 028 4207	CARBON 100K JA 1/8W	1	D 21	407 027 6907	LED SLP-153B (Search)	1
R78	401 031 7202	CARBON 47K JA 1/8W	1	D 22	407 027 6907	LED SLP-153B (Erase)	1
R79	401 028 3705	CARBON 10K JA 1/8W	1	D 23	407 027 6907	LED SLP-153B (F.FWD)	1
R80	401 031 7202	CARBON 47K JA 1/8W	1	D 24	407 027 6907	LED SLP-153B (Play)	1
R81	401 032 0103	CARBON 560 JA 1/8W	1	D 25	407 027 6907	LED SLP-153B (2.4cm)	1
R82	401 030 0709	CARBON 22K JA 1/8W	1	D 26	407 027 6907	LED SLP-153B (1.2cm)	1
R83	401 028 3200	CARBON 1K JA 1/8W	1	R103	401 032 0103	CARBON 560 JA 1/8W	1
R84	401 030 0709	CARBON 22K JA 1/8W	1	R104	401 032 0103	CARBON 560 JA 1/8W	1
R86	401 028 4702	CARBON 1M JA 1/8W	1	R105	401 032 0103	CARBON 560 JA 1/8W	1
R87	401 028 3705	CARBON 10K JA 1/8W	1	R106	401 032 0103	CARBON 560 JA 1/8W	1
R88	401 028 3705	CARBON 10K JA 1/8W	1	R107	401 032 0103	CARBON 560 JA 1/8W	1
R89	401 028 3705	CARBON 10K JA 1/8W	1	R108	401 032 0103	CARBON 560 JA 1/8W	1
R90	401 029 5500	CARBON 18K JA 1/8W	1	R109	401 032 0103	CARBON 560 JA 1/8W	1
R91	401 029 5500	CARBON 18K JA 1/8W	1				
R92	401 029 5500	CARBON 18K JA 1/8W	1				
R93	401 029 5500	CARBON 18K JA 1/8W	1				
R94	401 030 0709	CARBON 22K JA 1/8W	1				
R95	401 029 5500	CARBON 18K JA 1/8W	1				
R96	401 031 6601	CARBON 4.7K JA 1/8W	1				
R97	401 032 8703	CARBON 8.2K JA 1/8W	1				
R98	401 031 5505	CARBON 47 JA 1/8W	1				
R99	401 030 0204	CARBON 2.2K JA 1/8W	1				
R100	401 029 6804	CARBON 2.2 JA 1/8W	1				
R101	401 030 8705	CARBON 330 JA 1/8W	1				
R102	401 032 0103	CARBON 560 JA 1/8W	1				
R110	401 028 7109	CARBON 1.2K JA 1/8W	1				
R111	401 029 5005	CARBON 1.8K JA 1/8W	1				
R112	401 028 3705	CARBON 10K JA 1/8W	1				
R113	401 028 8106	CARBON 120K JA 1/8W	1				
R114	401 030 0709	CARBON 22K JA 1/8W	1				
R115	401 031 5505	CARBON 47 JA 1/8W	1				
R116	401 031 5505	CARBON 47 JA 1/8W	1				
R201	401 032 0103	CARBON 560 JA 1/8W	1				
R203	401 032 0608	CARBON 5.6K JA 1/8W	1				
R204	401 028 3705	CARBON 10K JA 1/8W	1				
R205	401 028 3200	CARBON 1K JA 1/8W	1				
R206	401 030 2802	CARBON 24K JA 1/8W	1				
R207	401 028 3705	CARBON 10K JA 1/8W	1				
R208	401 028 3705	CARBON 10K JA 1/8W	1				
R209	401 030 2802	CARBON 24K JA 1/8W	1				
R210	401 029 7900	CARBON 200 JA 1/8W	1				
R211	401 032 2701	CARBON 620 JA 1/8W	1				
R212	401 028 3705	CARBON 10K JA 1/8W	1				
R213	401 031 6106	CARBON 470 JA 1/8W	1				
R214	401 028 3705	CARBON 10K JA 1/8W	1				
R215	401 031 6106	CARBON 470 JA 1/8W	1				
R216	401 031 6106	CARBON 470 JA 1/8W	1				
R217	401 031 6106	CARBON 470 JA 1/8W	1				
R218	401 016 1508	CARBON 22 JA 1/4W	1				
R219	401 018 2800	CARBON 330 JA 1/4W	1				
RA 1	4-2219-71790	Resistor 22Kx10 J	1				
RA 2	4-2219-71520	Resistor 22Kx4 J	1				
RA 3	4-2219-71780	Resistor 22Kx3 J	1				
RA 4	4-2219-71520	Resistor 22Kx4 J	1				

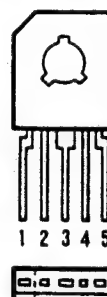
IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SB926 2SC536 2SD545		
ON2170Q		—
2SA608 2SC1012 DTA114ES DTA114YS DTA124ES DTC114TS DTC314TS		
2SD612		
TERMINAL NAME		
B — BASE C — COLLECTOR E — EMITTER K — CATHODE A — ANODE		

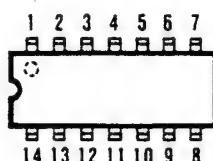
LA4160 BOTTOM VIEW



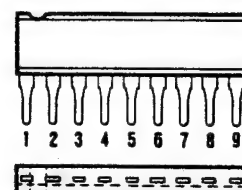
LA5522 FRONT/BOTTOM VIEWS



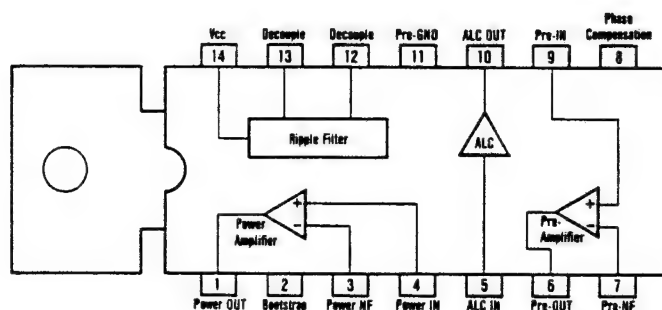
LC4066B BOTTOM VIEW



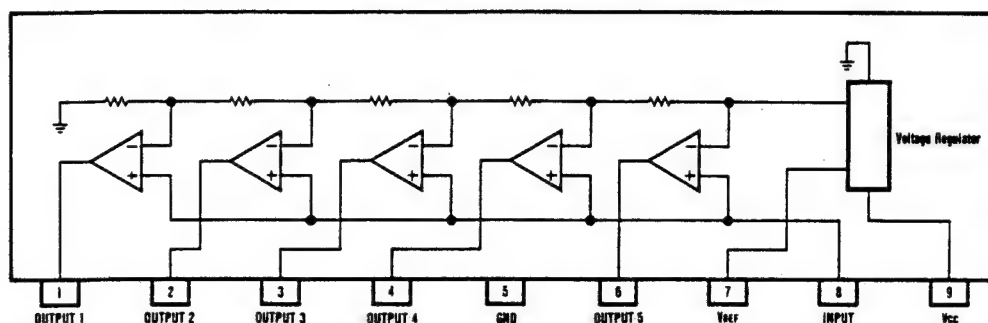
BA6104 FRONT/BOTTOM VIEWS



LA4160 BLOCK DIAGRAM

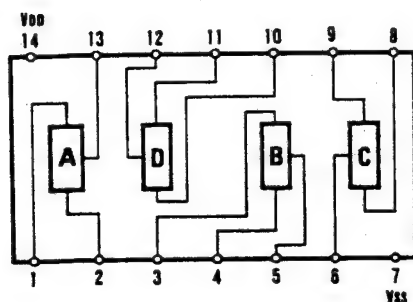


BA6104 BLOCK DIAGRAM

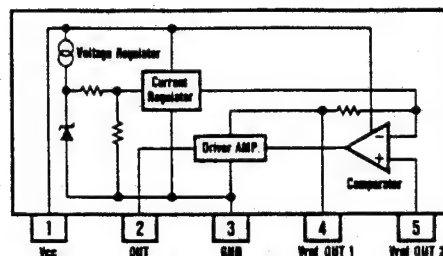


IC & TRANSISTOR LEAD IDENTIFICATION (Continued)

LC4066B BLOCK DIAGRAM



LA5522 BLOCK DIAGRAM



REFERENCE VOLTAGES

IC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Power ON	0.1	10.5	0.8	0	0	4.9	4.8	9.0	4.8	0	0	4.8	9.7	10.8
TEL. REC.	-	8.8	1.4	-	0.2	4.1	4.0	7.4	4.0	-	-	4.0	8.1	9.1
Playback	4.8	8.9	0.5	-	0	-	-	-	-	-	-	-	-	-
Rewind	0.1	10.0	0.9	-	-	4.6	4.6	8.5	4.6	-	-	4.6	9.2	10.3
F.Forward	-	-	-	-	-	-	-	8.4	4.5	-	-	4.5	9.3	-

IC201

	1	2	3	4	5
Power ON	5.0	3.1	0	3.8	3.3
TEL. REC.	-	2.5	-	3.2	2.7
Playback	-	-	-	-	-
Rewind	-	2.3	-	3.0	2.5
F.Forward	-	-	-	-	-

IC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Power ON	0	0	-	-	-	0	0	0	0	0	0	3.7	5.0	5.0
TEL. REC.	-	-	-	-	-	4.6	-	-	-	-	-	0	0	-
Playback	-	-	-	-	-	0	-	-	-	-	-	3.6	5.0	5.2
Rewind	-	-	-	-	-	-	-	-	-	-	-	3.7	0	5.0
F.Forward	-	-	-	-	-	-	-	-	-	-	-	-	-	-

IC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Power ON	1.9	5.5	5.5	5.5	5.5	5.0	5.0	5.6	5.0	0	4.7	10.2	5.1	5.1	5.0	5.0	4.6	10.6	3.7	0	0
TEL. REC.	2.0	4.6	4.6	4.6	4.6	-	-	4.6	-	-	0	8.8	0.2	5.0	0	0	-	4.6	0	-	-
Playback	1.9	-	-	-	-	-	-	4.7	-	-	4.6	-	-	-	5.0	5.0	0	9.0	3.6	-	-
Rewind	-	5.3	5.3	5.3	5.3	-	-	5.6	-	-	-	9.8	5.0	0.2	-	0	-	5.2	3.7	-	-
F.Forward	2.0	5.2	5.2	5.2	5.2	-	-	5.3	-	-	-	10.1	0.2	5.0	-	-	-	-	-	-	-

IC3

	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Power ON	10.8	3.5	4.5	5.0	5.0	3.3	2.6	1.4	-	0	5.0	5.0	5.0	0	5.0	5.0	5.0	5.0	5.0	5.0	2.8
TEL. REC.	0	-	-	8.6	0	3.8	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-
Playback	-	0.2	-	8.8	5.0	0	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Rewind	10.3	3.5	-	0.2	-	3.3	-	1.4	-	-	5.0	-	-	-	-	-	-	-	-	-	-
F.Forward	-	-	0.2	8.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

IC4

	1	2	3	4	5	6	7	8	9
Power ON	10.1	10.1	10.1	10.1	0	10.1	1.0	1.3	10.8
TEL. REC.	8.4	8.4	8.4	8.4	-	8.4	-	-	9.1
Playback	-	-	-	-	-	-	-	-	-
Rewind	9.6	9.6	9.6	9.6	-	9.6	-	-	10.3
F.Forward	-	-	-	-	-	-	-	-	-

IC4

	1	2	3	4	5	6	7	8	9
No Operation	H	H	H	H	0	H	1.0	1.3	10.9
Play	H	H	H	H	0	L	-	0.9	9.2
Backspace	H	H	H	L	0	L	-	0.7	10.3
Dictate	H	H	L	L	0	L	-	0.5	9.2
F.Forward	H	L	L	L	0	L	-	0.3	10.3
Back	L	L	L	L	0	L	-	0	-
Index	H	H	L	L	0	L	-	0.5	9.2

H = High Level (5V) L = Low Level (0V)

REFERENCE VOLTAGES (Continued)

	Q1			Q2			Q3			Q4			Q5			Q6			Q7		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Power ON	0.2	0	0	0	3.6	0	0.6	0	0	0.7	0	0	1.9	3.5	3.5	0.7	0	0	0.7	0	0
TEL. REC.	4.5	"	"	"	"	"	0	"	"	"	"	"	4.2	3.9	3.9	—	—	—	—	"	—
Playback	0.2	"	"	"	"	"	"	"	"	0.1	"	"	0	0	0	0.7	0	0	0.7	"	0
Rewind	"	"	"	"	"	"	0.6	"	"	"	"	"	"	"	"	"	"	"	"	"	"
F.Forward	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

	Q8			Q9			Q10			Q11			Q12			Q13			Q14		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Power ON	0.2	4.9	5.1	0.2	0.2	0	4.5	0	5.0	1.8	5.0	1.2	0.8	2.3	0.2	0.6	2.3	0.1	0	4.8	0
TEL. REC.	4.5	—	5.0	0.4	4.1	0.15	5.0	"	"	"	"	"	"	"	"	"	"	"	"	4.6	"
Playback	0.2	4.9	"	0.2	0.2	0	4.5	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rewind	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4.8	"
F.Forward	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

	Q15			Q16			Q17			Q18			Q19			Q20			Q21		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Power ON	3.8	4.4	4.4	0.7	0	0	5.0	0	5.0	11.0	0	11.0	0.1	11.0	0	0	11.0	0	10.5	0	11.0
TEL. REC.	3.0	—	5.0	0	4.9	2.0	0	5.0	"	0	9.3	9.3	0.7	0	"	"	3.0	"	9.3	"	9.3
Playback	3.8	4.4	4.4	"	0	0	5.0	0	"	"	"	"	"	"	"	"	"	"	"	"	"
Rewind	3.9	"	"	0.7	"	"	"	"	"	11.0	0	10.5	0	10.5	"	"	10.5	"	10.5	"	10.5
F.Forward	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

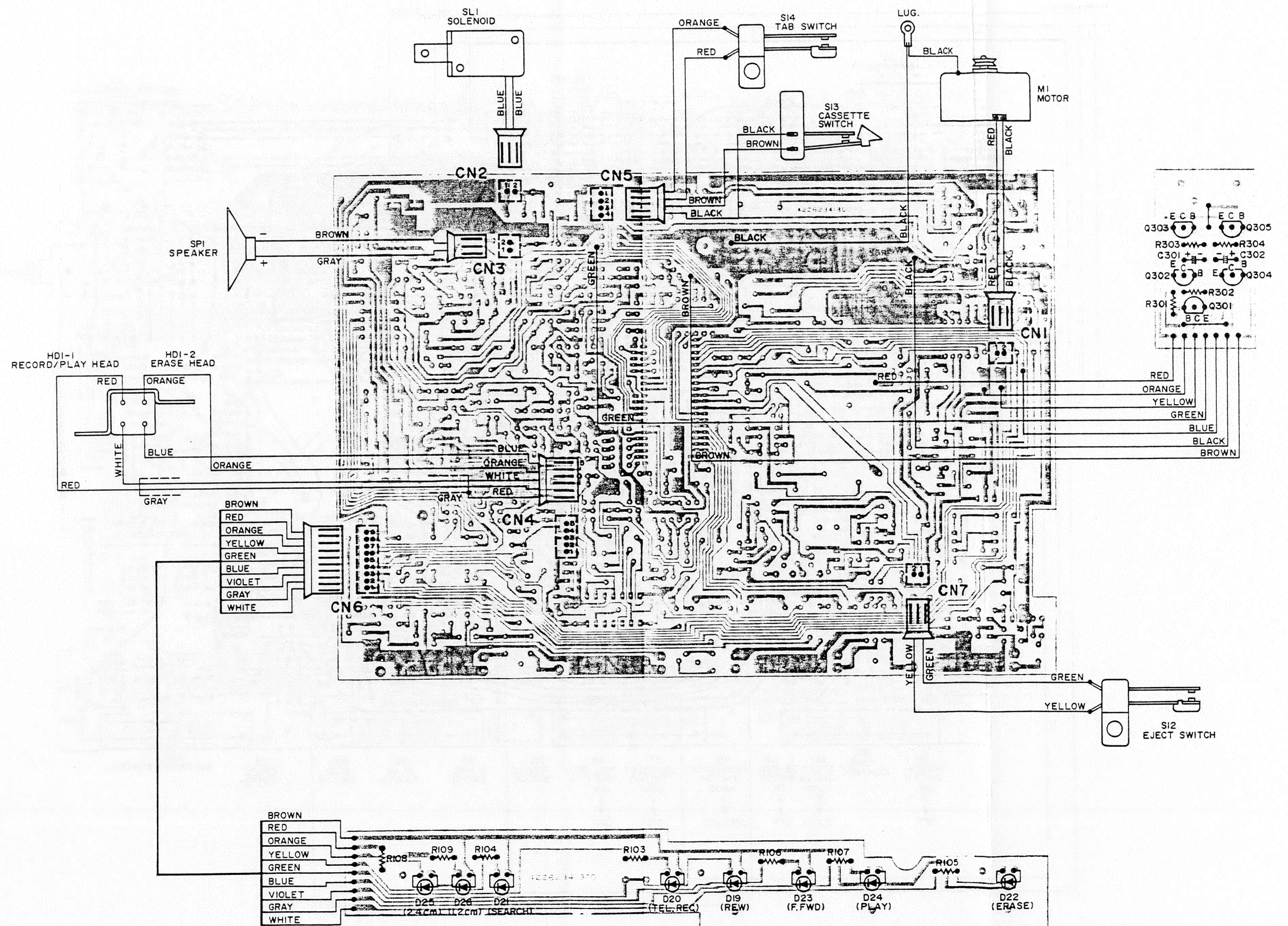
	Q22			Q23			Q24			Q25			Q26			Q27			Q28		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Power ON	5.0	0.3	5.0	1.5	0	1.5	0	5.0	0	4.5	5.0	5.0	0	5.0	0	6.9	10.9	6.3	5.7	11.0	5.0
TEL. REC.	0	4.9	"	0.4	1.1	1.2	0.6	0	"	—	—	"	"	"	"	"	9.2	"	"	9.2	"
Playback	5.0	0.3	"	"	"	"	"	"	"	—	—	"	"	"	"	"	"	"	"	"	"
Rewind	"	"	"	1.5	0	1.5	0	5.0	"	—	—	"	"	"	"	"	10.3	"	"	10.5	"
F.Forward	"	"	"	"	"	"	"	"	"	—	—	"	"	"	"	"	"	"	"	"	"

	Q29			Q30			Q33			Q34			Q201			Q202			Q203		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Power ON	0	0	0	5.0	0	5.0	0.2	0	0	0	10.4	0	3.7	3.1	3.1	0	3.1	3.1	0	4.1	0
TEL. REC.	5.0	"	"	0	5.0	"	0.5	"	"	5.0	0	"	0	2.6	2.6	3.2	2.6	2.6	0.6	0	"
Playback	0	"	"	5.0	0	"	0.2	"	"	0	9.0	"	3.2	"	"	0	"	"	0	3.6	"
Rewind	5.0	"	"	0	5.0	"	"	"	"	5.0	0	"	0	2.2	2.2	3.0	2.2	2.2	0.6	0	"
F.Forward	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

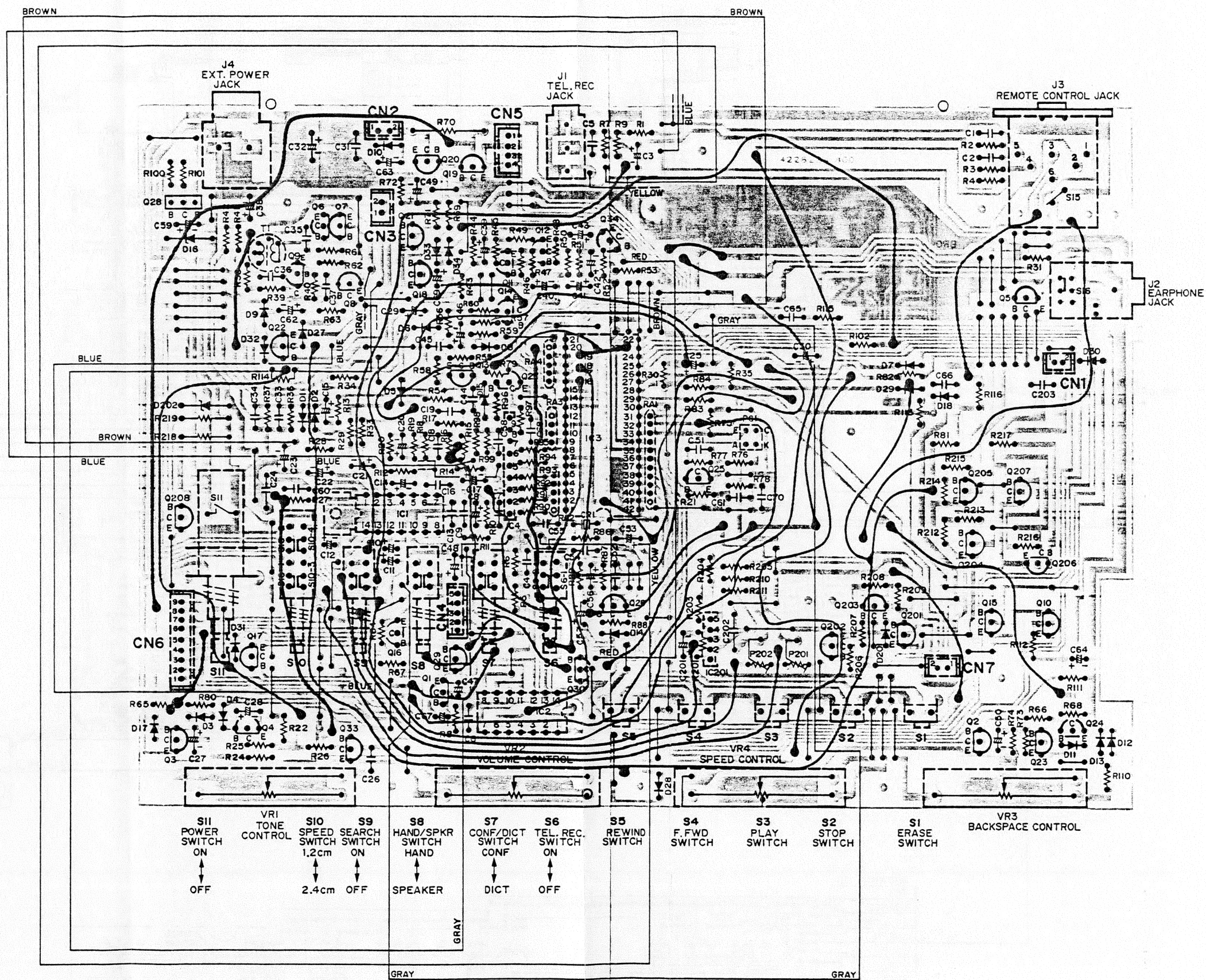
	Q204			Q205			Q206			Q207			Q208			Q301			Q302		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Power ON	5.0	0	5.0	5.0	0	5.0	0	0	3.1	0	0	3.1	5.7	10.7	5.1	—	0	0	10.5	—	—
TEL. REC.	"	2.6	"	4.2	5.0	"	3.4	2.7	2.6	2.6	5.0	2.6	"	7.8	5.0	—	5.0	2.6	9.3	—	—
Playback	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rewind	4.2	5.0	"	5.0	2.4	"	2.4	5.0	2.2	3.0	2.4	2.2	"	8.5	"	—	2.4	5.0	10.5	—	—
F.Forward	5.0	2.3	"	4.2	5.0	"	3.0	2.2	"	2.2	5.0	"	"	8.1	"	—	5.0	2.3	"	—	—

	Q303			Q304			Q305		
	B	C	E	B	C	E	B	C	E
Power ON	4.5	—	5.0	4.5	—	0	11.0	0	5.0
TEL. REC.	"	—	"	"	—	4.5	0	4.5	"
Playback	"	—	"	"	—	"	"	"	"
Rewind	"	—	"	"	—	0	11.0	0	"
F.Forward	0	—	"	0	—	"	"	"	"

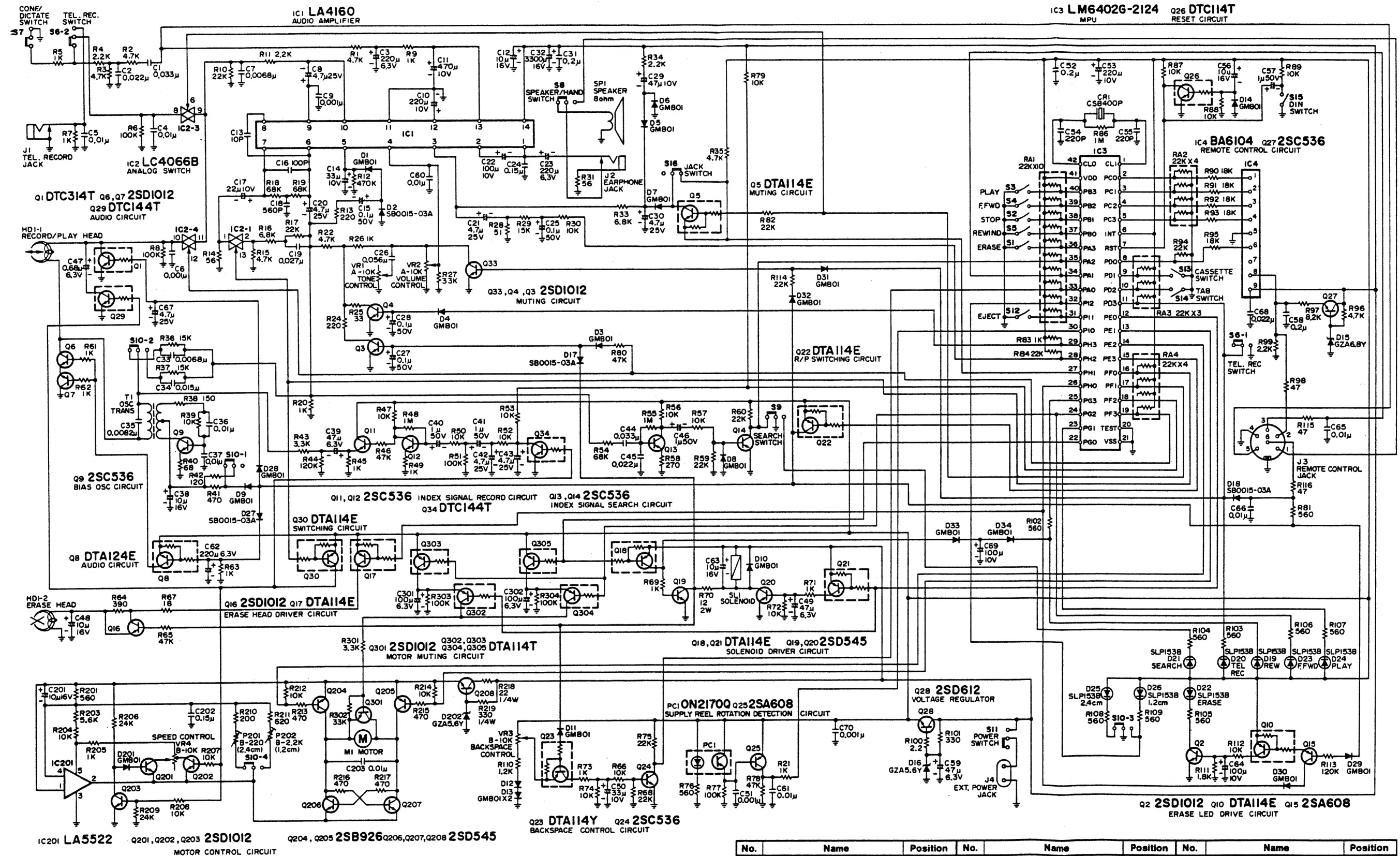
P.C.BOARD & WIRING DIAGRAM



AMPLIFIER P.C.BOARD DIAGRAM

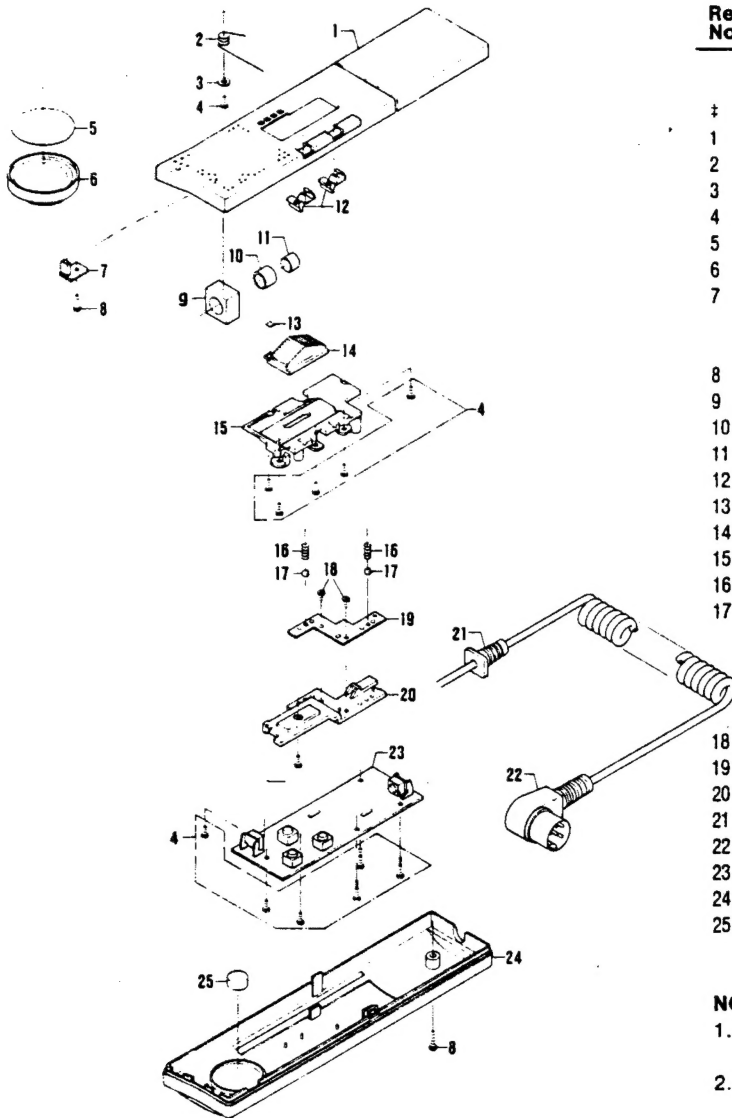


SCHEMATIC DIAGRAM



HAND CONTROL

Exploded View



Parts List

Ref. No.	Part No.	Description	Q'ty
HAND CONTROL			
†	4-1929-70310	Hand Control (HM-52)	1
1	141-2-1129-63200	Cabinet Top Hand	1
2	141-2-8559-20200	Spring Review	1
3	411 087 4704	WASHER V 2X6X0.4	1
4	411 022 6305	SCR S-TPG PAN 1.7X4	13
5	141-2-4419-26800	Sheet Speaker	1
6	4-1519-73190	Speaker	1
7	141-0-1939-26500	Hand Mic. LED P.C.B. Assy	1
	4-2262-37680	PCB, LED Hand Mic.	1
	407 092 8004	LED GL-2PR7 (Dictate)	1
8	411 022 7906	SCR S-TPG PAN 2X6	2
9	141-2-4469-61900	Cushion Mike	1
10	141-2-3899-17300	Holder Microphone	1
11	4-1539-70720	Microphone	1
12	141-2-1659-99200	Button Cue Tone	2
13	141-2-1459-12500	Sheet Flag	1
14	141-2-1649-54600	Knob Main	1
15	141-2-2149-33700	Holder Knob	1
16	141-2-8559-20100	Spring Click	2
17	141-2-8259-15200	Ball	2
18	411 022 6008	SCR S-TPG PAN 1.7X3	2
19	141-2-2529-12100	Plate Slider	1
20	141-2-1649-54500	Slider	1
21	141-0-1939-24060	Hand Mic. P.C.B. Assy	1
22	141-2-4459-45400	Protector	1
23	4-2369-76980	Plug Cord 6P	1
24	141-2-1129-63300	Cabinet Bottom Hand	1
25	141-2-4469-62000	Cushion Speaker	1

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

Hand Control Schematic Diagram

